Mac OS X Server Overview

Session 603

These are confidential sessions—please refrain from filming or taking pictures.

Enterprise IT

Mac OS X Server Version 10.4 “Tiger”

Greg Burns
Sr. Director
Server and Storage Software Engineering

https://developer.apple.com/wwdcsecure/

Tiger Server

Mac OS X Server

Easiest server in the world to setup and deploy

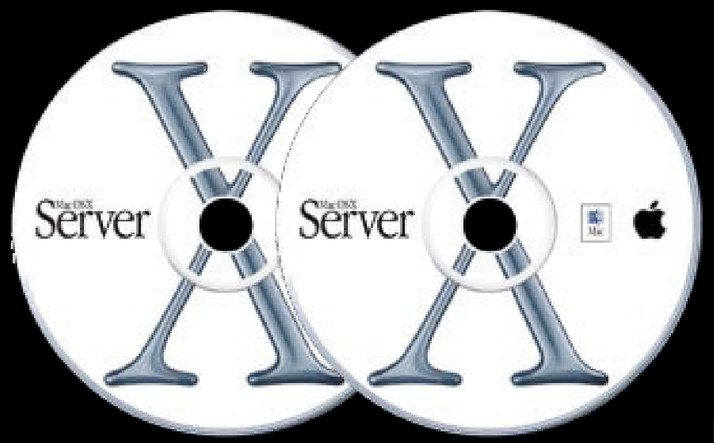
Mac OS X Server

Best server for mixed Mac and Windows environments

Mac OS X Server

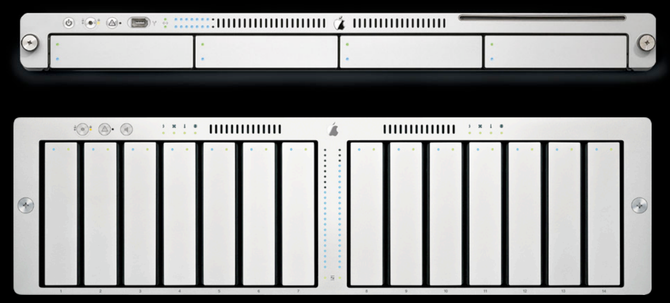
Simplest server for deploying scalable, open source server solutions

Blazing Pace of Innovation



2001

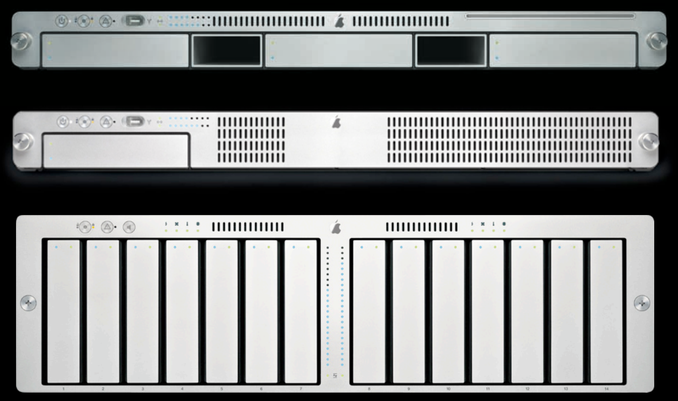
2002



2003

Blazing Pace of Innovation

2004



2005

Tiger Server

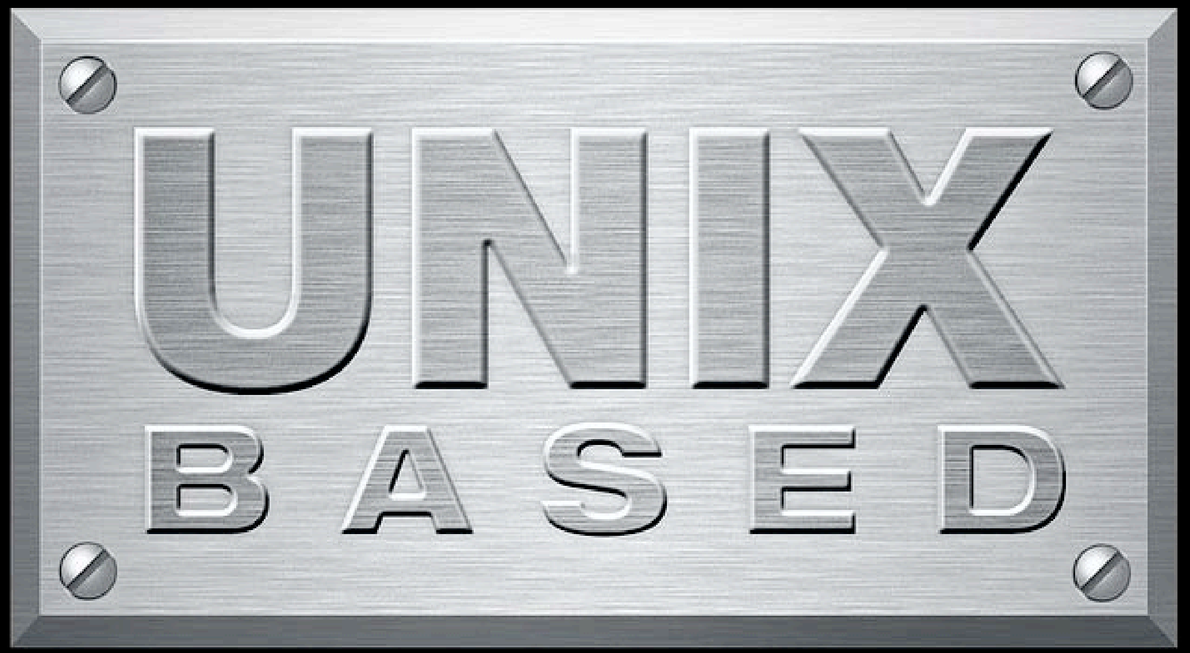
Apple's Server Strategy

Industry standard

Open source

Innovation

Industry Standard



Open Source

APACHE

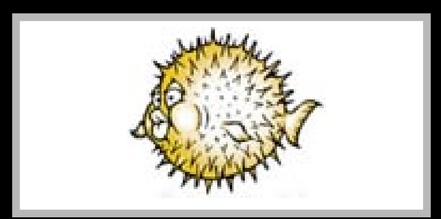
OpenLDAP
PROJECT

samba

MySQL

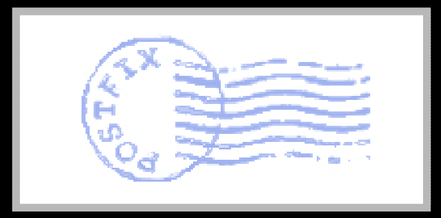
perl

FreeBSD



jboss

Jabber


POSTFIX

blojsom

UNIX
PRINTING
SYSTEM

php

axis

SquirrelMail
WEBMAIL FOR NUTS

SpamAssassin

APACHE ANT

SQLite

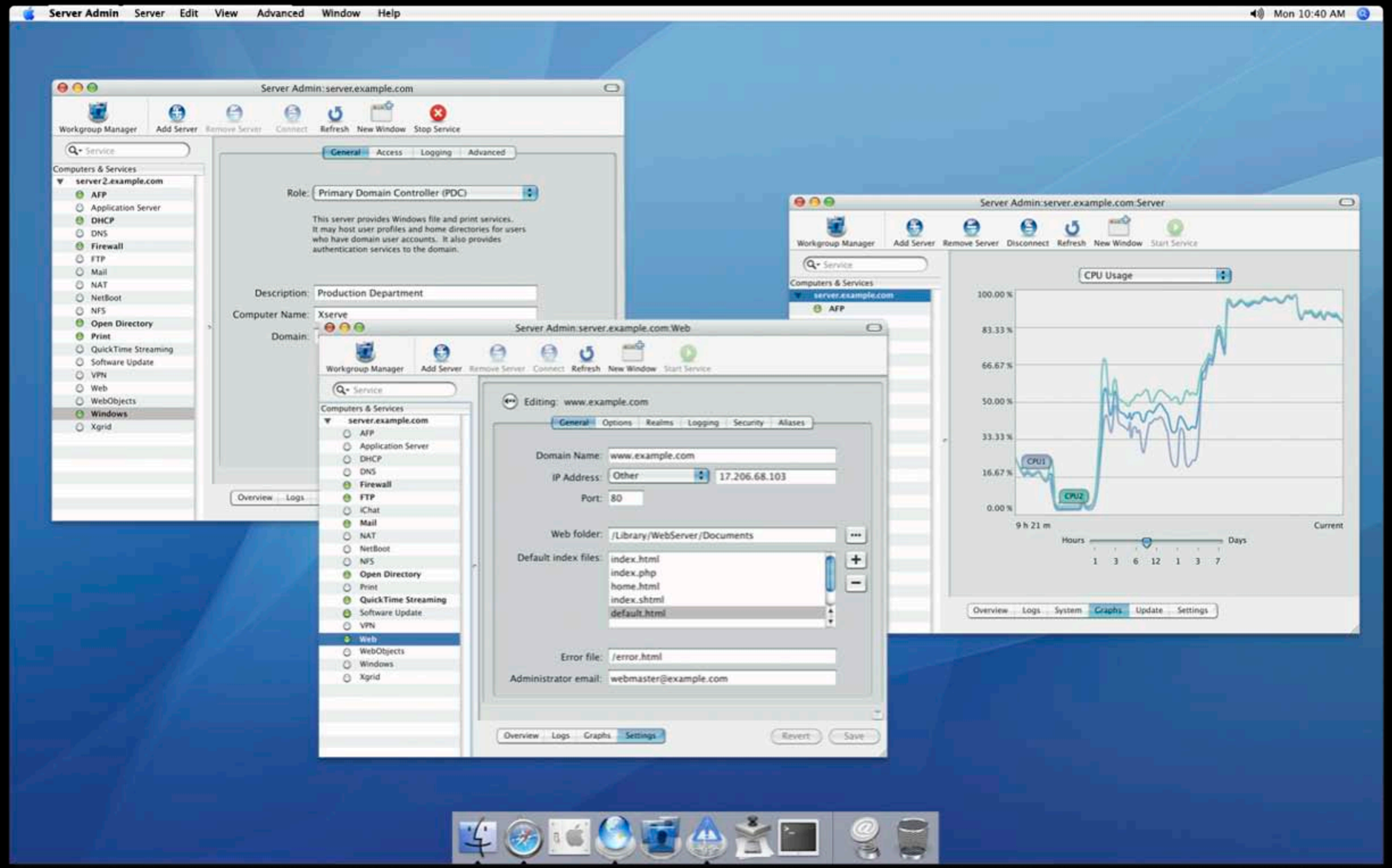
DELIVERED BY:
MAILMAN
MAIL LISTS

OpenSSL

DAV

python

Innovation


Server Admin Server Edit View Advanced Window Help
Mon 10:40 AM
Server Admin: server.example.com
Workgroup Manager
Add Server
Remove Server
Connect
Refresh
New Window
Stop Service
Service
Computers & Services
server2.example.com
AFP
Application Server
DHCP
DNS
Firewall
FTP
Mail
NAT
NetBoot
NFS
Open Directory
Print
QuickTime Streaming
Software Update
VPN
Web
WebObjects
Windows
Xgrid
General
Access
Logging
Advanced
Role: Primary Domain Controller (PDC)
This server provides Windows file and print services. It may host user profiles and home directories for users who have domain user accounts. It also provides authentication services to the domain.
Description: Production Department
Computer Name: Xserve
Domain:
Overview
Logs
Server Admin: server.example.com: Web
Editing: www.example.com
General
Options
Realms
Logging
Security
Aliases
Domain Name: www.example.com
IP Address: Other 17.206.68.103
Port: 80
Web folder: /Library/WebServer/Documents
Default index files: index.html index.php home.html index.shtml default.html
Error file: /error.html
Administrator email: webmaster@example.com
Graphs
Settings
Revert
Save
Server Admin: server.example.com: Server
Disconnect
Start Service
CPU Usage
100.00 %
83.33 %
66.67 %
50.00 %
33.33 %
16.67 %
0.00 %
CPU1
CPU2
9 h 21 m
Current
Hours
Days
1 3 6 12 1 3 7
System
Update

University of Tokyo • U.S. Navy • Oregon State University • Blue Cross Blue Shield • Stanford University • Target • Werner Enterprises • CGG • Genentech • American Electric • Qwest Communications •

Customer Adoption

• Watson Wyatt• COLSA Corporation • • Pacific Title• Henrico County Schools • NASA • Conde Nast • Virginia Tech University • Yale University • Disney Animation • Shaw Newspapers • Temasek Life Sciences Laboratory • Lumar Pictures • Norwegian Broadcasting • Beth Israel Deaconess Medical Center • Mitre Corporation • University of Miami • Lawrence Livermore National Labs • Cimmeron Group • University of Bergen • Radio Bremen • Texas A&M University • Dana Farber Cancer Institute • Austrialia Ministry of Defense • Ascent Media • Jet Propulsion Laboratory • Pixar • TVN • University of Albany • Danforth Plant Institute • Mayo Clinic • BBC Technology • Yahoo • University of New Mexico • CNN • Princeton University • Outpost Digital • National Institute of Health • McGill University • Atlanta Constitution • Campbell —Ewald • RiskWise • University of Michigan • 21st Century Publishing • Bunim—Murray Productions • The Weather Channel • United States Department of Agriculture • Hunter College • University of Kentucky • Dockhouse Film & TV • Queens College • Business Week • Children's Research Institute • Havana Productions • University of North Carolina Charlotte • NBC Universal • Hallmark • University of Michigan Dearborn • American Express Publishing • Colby College • Granada Media • Binghamton University • Oracle • Universal Music Group • Martha Stewart Living • Standards and Poor's • Idaho State University • Forbes • National Institute of Environmental Health Sciences • Time • Optix Digital Pictures • University of Florida • Northstar Travel Media • Rose Publishing • University of Chicago • Spectrum Visual Networks • University of Toronto • Furman University • Rockerfeller University • Pacific Healthcare • Sony Pictures • Hallmark •

Developers

• Oracle Database 10g • PictureTalk Enterprise • 4D • Sybase ASE • Timbuktu •
• ATTO ExpressStripe •
• BRU Server •
• CommuniGate Pro •
• NetVault • eSuite4X •
• Berkeley DB
• Caststream, Inc •
• KeyServer
• Network Backup •
• eTrust Antivirus • FlashNet • Font Reserve Server • FrontBase • Funnel Web Analyzer • HELIOS • iAssist • Image Portal X • Intellitune • InterMapper • Kerio MailServer• LANsurveyor • Lasso • LSP for Mac OS X Server • MacCommerce Server • Macromedia JRun • MacSQL • MediaBank • MediaBeacon • CRYPTO-Server X • Cumulus • CyberGauge • Directory Federator Express • E-Meeting Portal • FileMaker Server • First Class • FirstSQL/J • Myrinet • NetMinder Ethernet • netOctopus • NotifyMail• Odystar • OpenBase SQL • Optix • Pitstop Server • Portfolio Server • PostOffice • Privoxy • Sawmill • Schroedinger • Sophos • Xinet • Zend Studio • Summary • Time Navigator • Urchin 5 Web Analytics Software • Virtuoso • Voltaire InfiniBand Clustering Solutions • VXA • PacketLoader • WebCrossing • WebDNA Enterprise Edition • Who's There? •

Mac OS X Server v10.4 “Tiger”

Over 200 New Features

100 Open Source Projects

- 64-Bit Applications
- Access Control Lists
- iChat Server
- Weblog Server
- Xgrid 1.0
- Portable Home Directories
- Managed Network Browsing
- Software Update Server

Core Server

Kazu Yanagihara
Sr. Engineering Manager

https://developer.apple.com/wwdcsecure/

Mac OS X Server Foundation

https://developer.apple.com/wwdcsecure/

Unix-based Foundation

Open source, core operating system based on Mach and BSD

- Mach 3.0 Micro-kernel
- FreeBSD 4.8 and FreeBSD 5
- Symmetric Multiprocessing (SMP)
- Fine-grained Multi-threading
- Protected Memory
- Unified Buffer Cache
- Real-time Scheduling

64
bit

64-bit Computing

For High-performance Computing

Memory Addressing	- 16 exabytes of virtual memory - 4 terabytes of physical memory
File Systems	
Math Operations	
Vector Image Libraries	
Development Tools	- Full 64-bit support in Xcode 2
32-Bit Compatibility	- Both 32-bit and 64-bit applications run natively

Open Directory

Standards-based Directory Services and Authentication Architecture

- LDAP-based Directory Server
- Kerberos Single Sign-on
- Legacy Authentication Support: APOP, DHX, etc.
- Foreign Directory System Compatibility:
  - Active Directory
  - NIS
  - /etc
- Replication and Automatic Fail-over
- Authenticated Binding

Access Control Lists

https://developer.apple.com/wwdcsecure/

File Access Control Lists

https://developer.apple.com/wwdcsecure/

Why File ACLs?

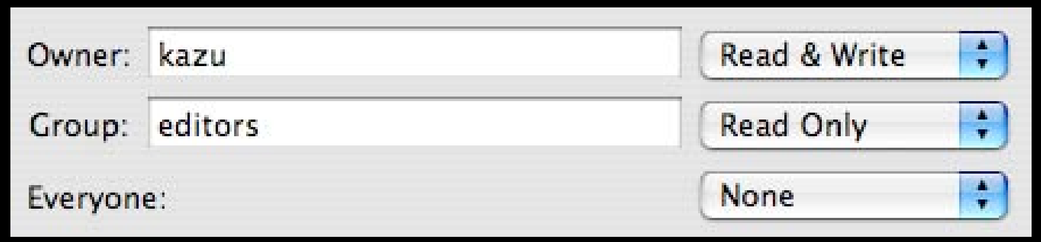
Enable Workflow

Better Windows Compatibility

Foundation for Future Innovation

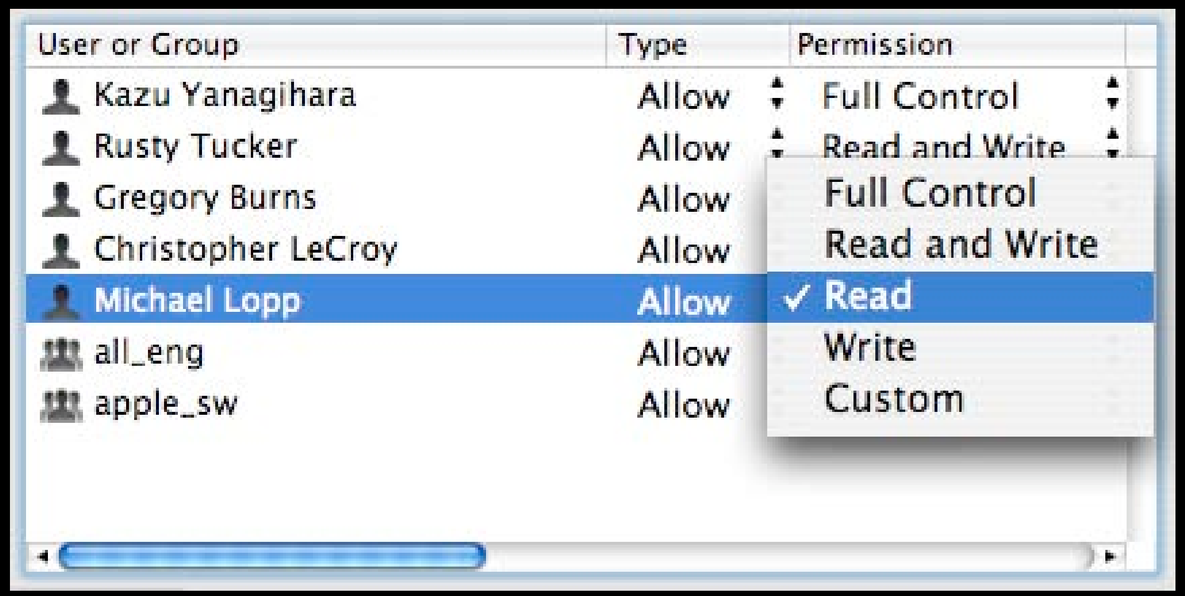
What are File ACLs?

- Fine Grained Permissions



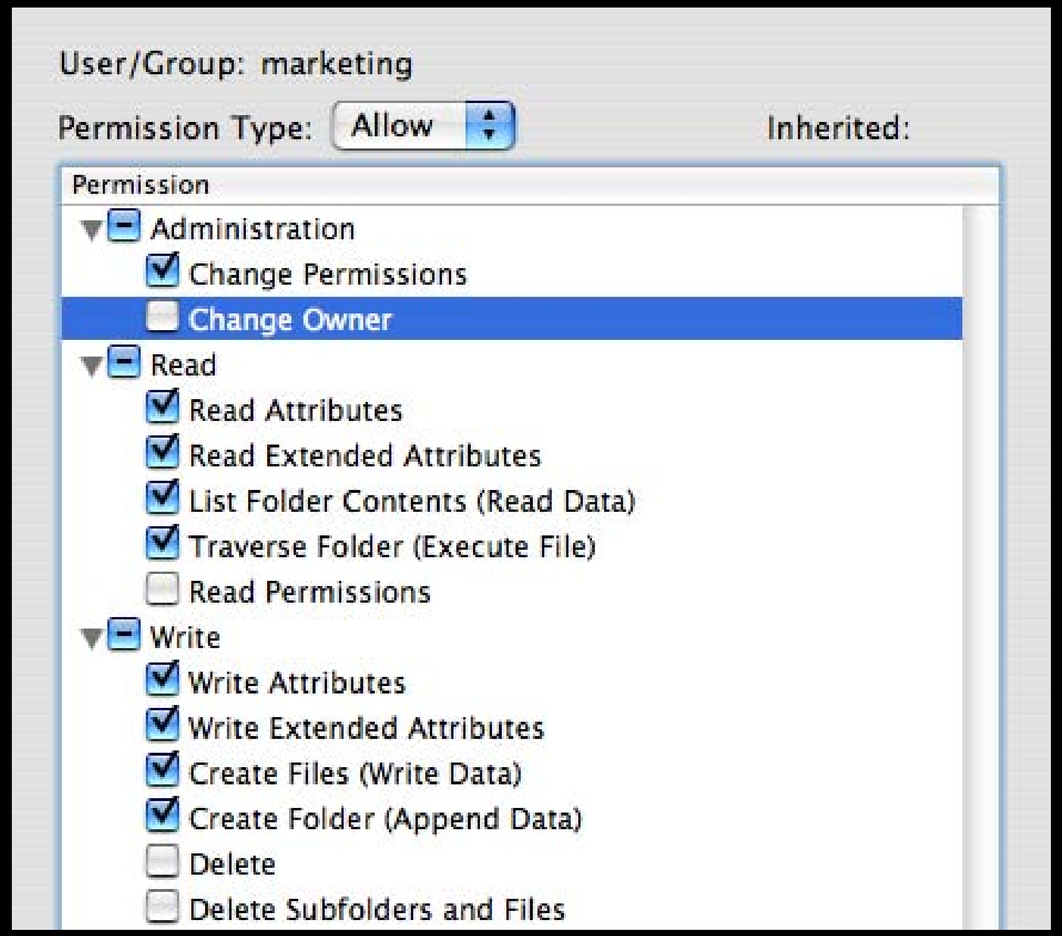
What are File ACLs?

- Fine Grained Permissions
  - Unlimited number of users and groups



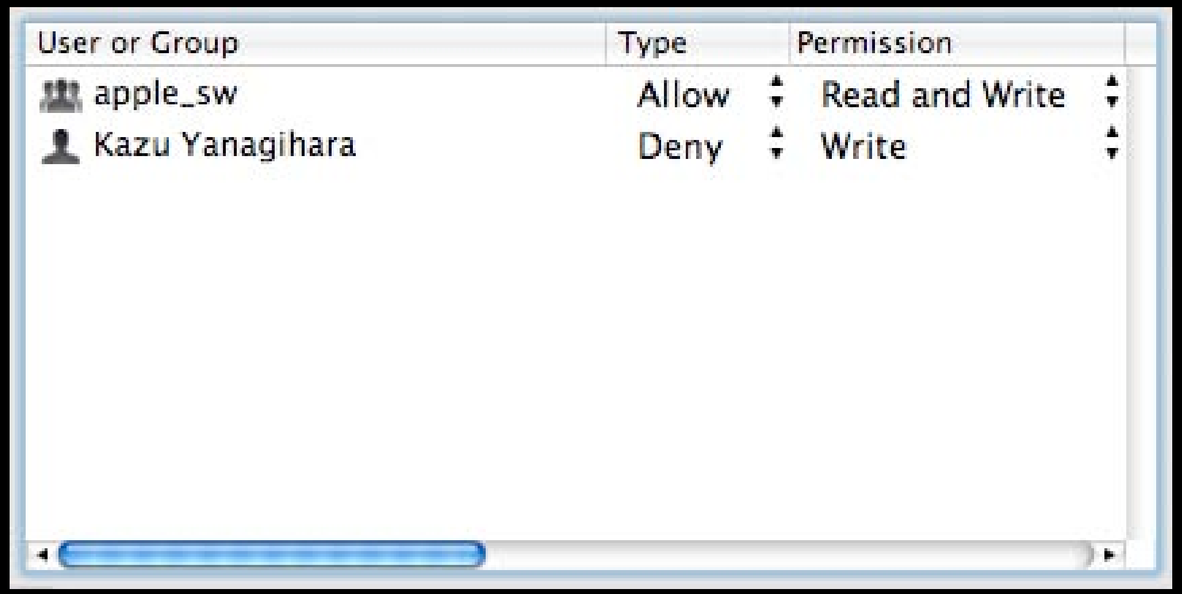
What are File ACLs?

- Fine Grained Permissions
  - Unlimited number of users and groups
  - More granular permissions



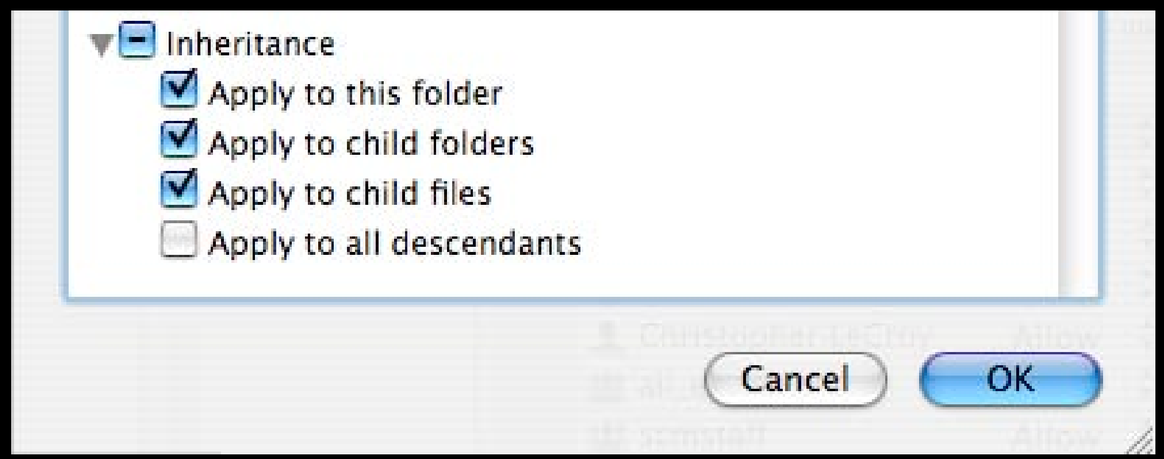
What are File ACLs?

- Fine Grained Permissions
  - Unlimited number of users and groups
  - More granular permissions
  - Allow or deny



What are File ACLs?

- Fine Grained Permissions
  - Unlimited number of users and groups
  - More granular permissions
  - Allow or deny
  - Inheritance



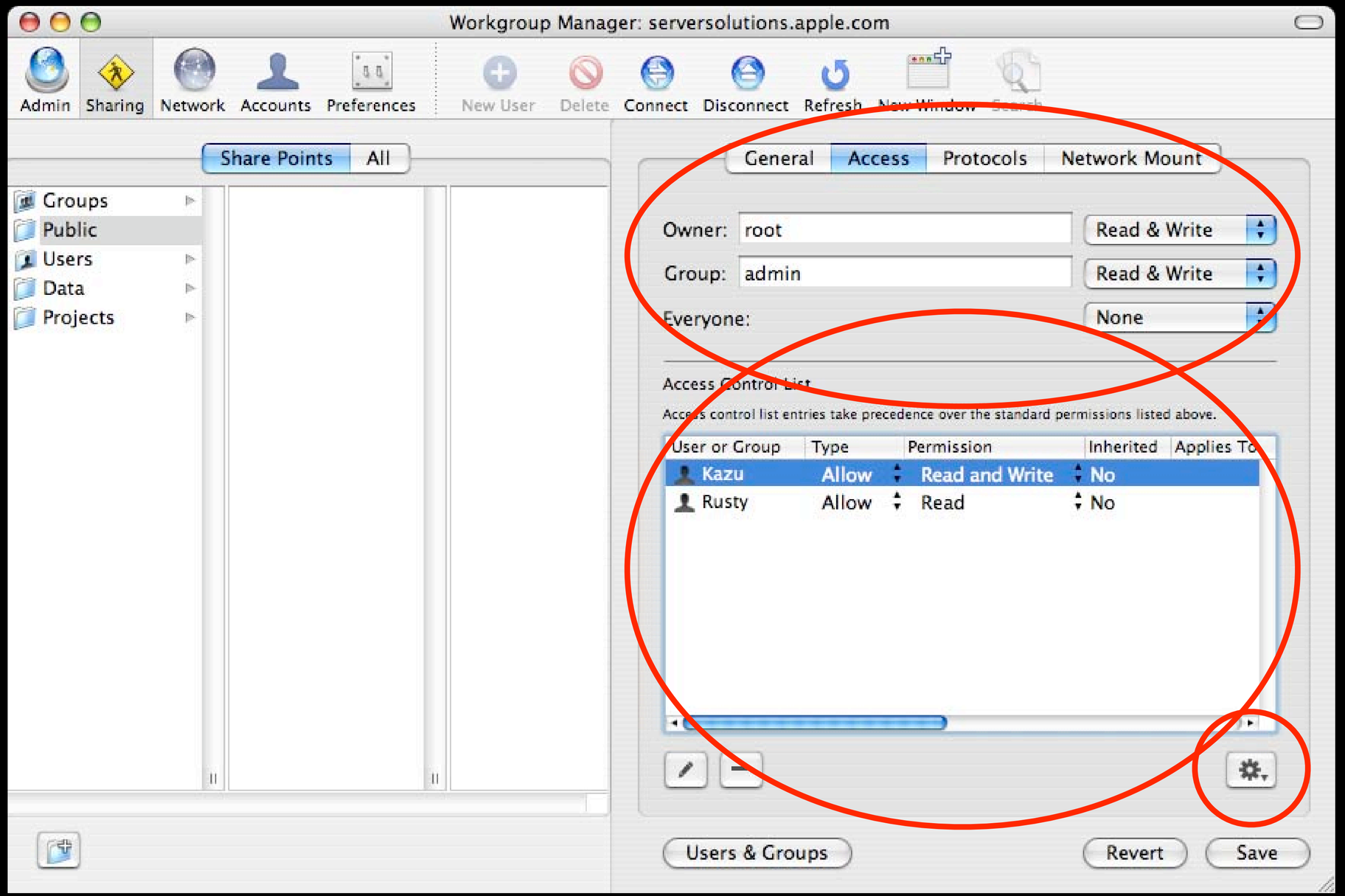
What are File ACLs?

- Fine Grained Permissions
  - Unlimited number of users and groups
  - More granular permissions
  - Allow or deny
  - Inheritance

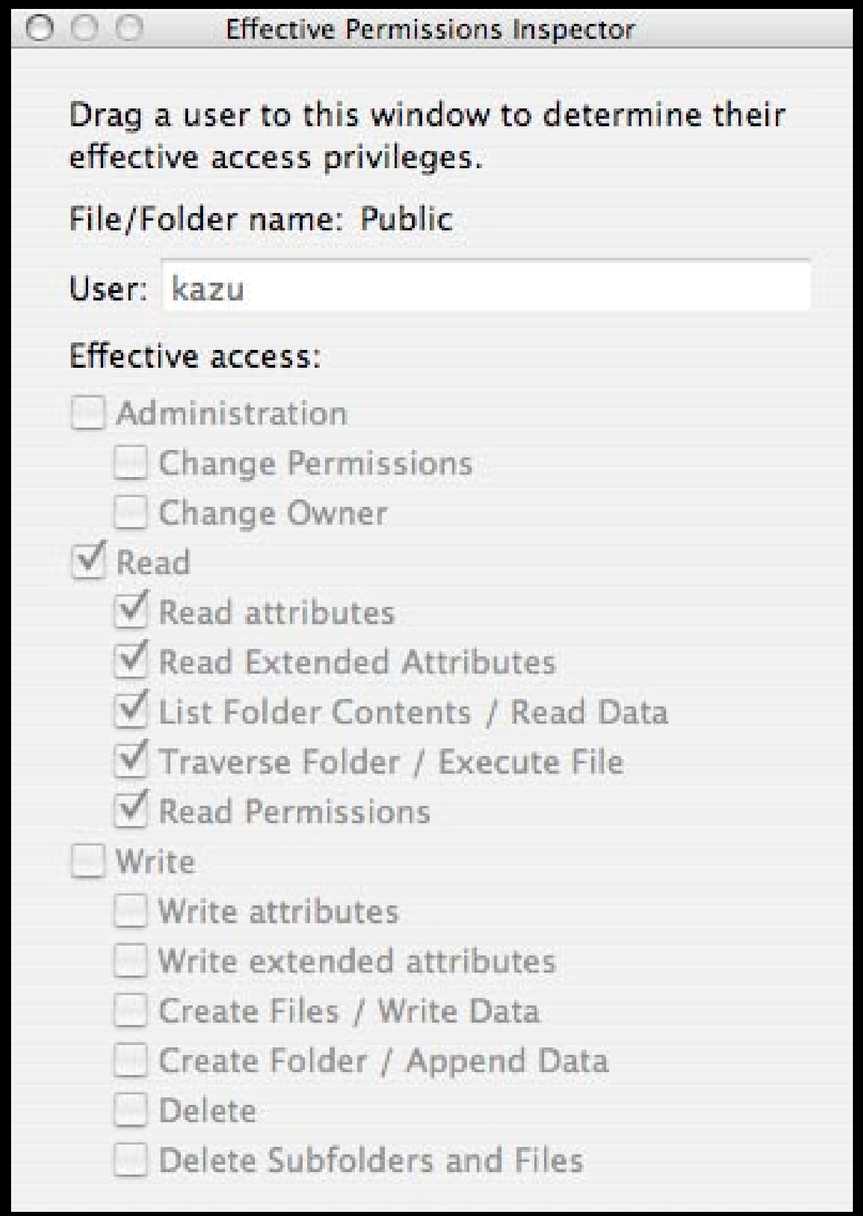
File Access Control Lists

Administration	- Enabled by default on Mac OS X Server - GUI and command line tools
System Wide Support	- Enforced by the kernel - File systems: HFS, AFP, SMB/CIFS - Command line tools, copy engines
Full Windows Compatibility	- Windows Server 2003 Active Directory environments - Windows XP clients
Other Enhancements	- Globally unique 128-bit GUIDs - Greater than 16 groups - Nested groups - “memberd”: group membership, ID translation

File ACL Administration



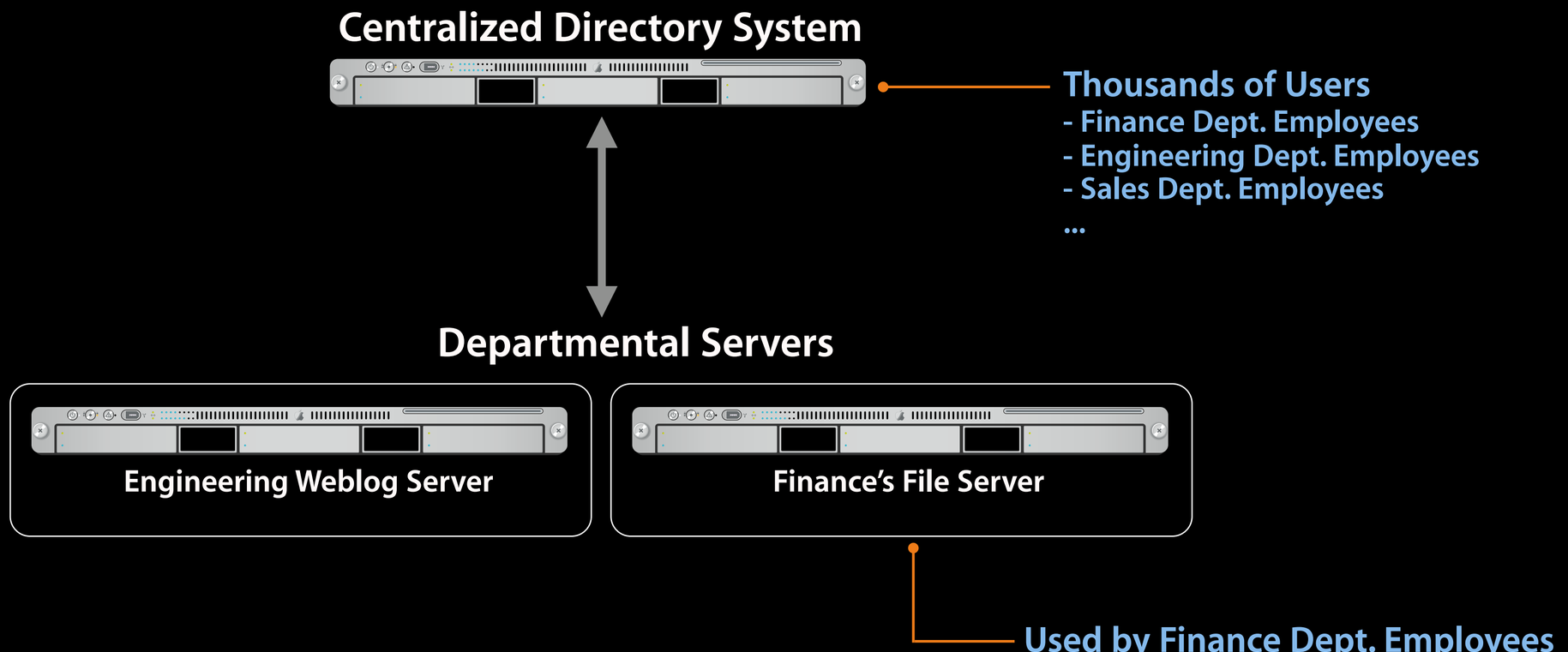
File ACL Administration



Service Access Control Lists

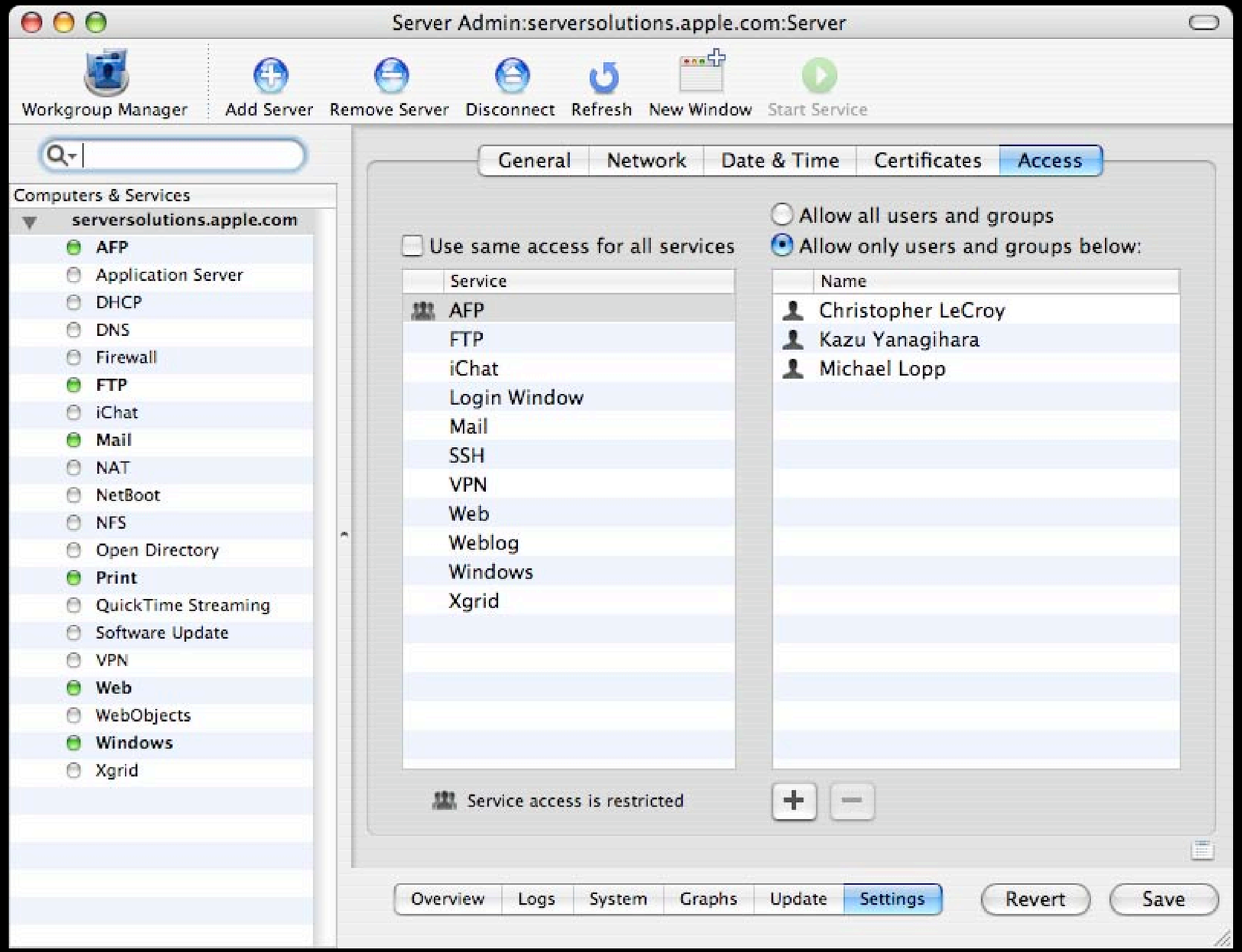
https://developer.apple.com/wwdcsecure/

Why Service Access Control Lists?



Not everyone in the centralized directory system should have access to all services on all servers bound to the directory

Service Access Control List Administration



Learn More About Access Control Lists

What's New with the File System	Session 506 Tuesday 5:00pm
Leveraging the Power of ACLs	Session 617 Wednesday 2:00pm

Collaboration

https://developer.apple.com/wwdcsecure/

iChat Server

Secure Instant Messaging

https://developer.apple.com/wwdcsecure/

Why Use Mac OS X Server for Instant Messaging?

Standards-based

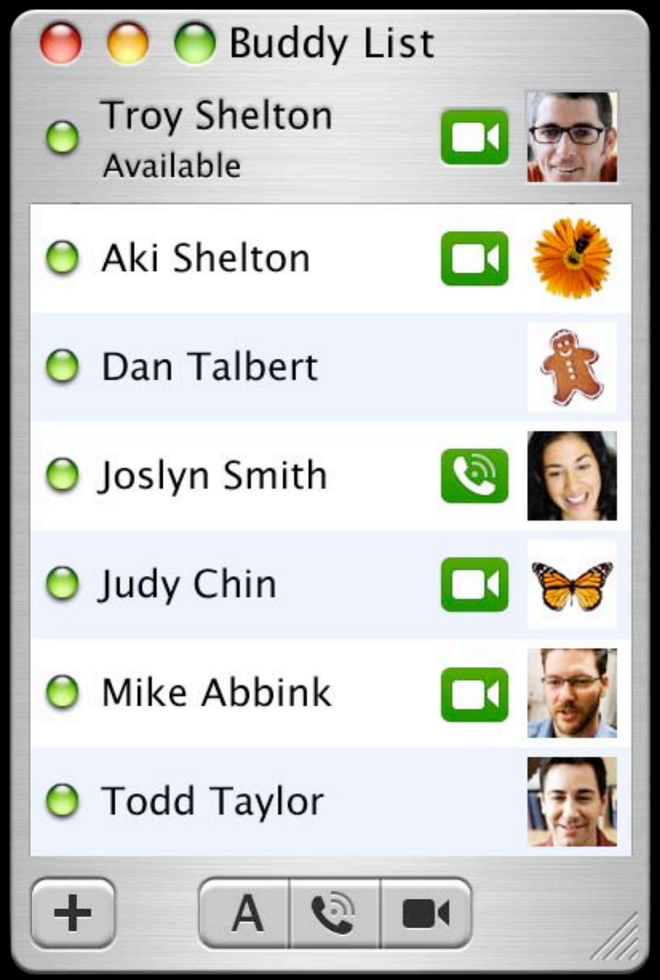
Easy Directory Integration

Encryption and Authentication

Cross-platform Collaboration

No Client Access Licenses

Low Deployment Costs



iChat Server

Secure Instant Messaging

Security	- Service Access Control support - Encrypted messaging using SSL - Buddy authorization
Cross Platform	- Works with Jabber clients for Mac OS X, Windows, Linux, and PDAs
Directory Integration	- "inside the firewall" messaging with Open Directory integration
iChat Integration	- Chat rooms - Audio and video conferencing
Flexibility	- "Store & forward" support

Deployment Example

Secure “Inside-the-Firewall” Instant Messaging

Accounts
Directory integration for user accounts and authentication

Open Directory Server

iChat Server

Encryption
Private communications to server using SSL encryption and authentication

Standards-based
Cross-platform support using Jabber protocol

Ethernet Switch

Local Area Network

iChat AV
Audio and video conferencing with iChat AV in Mac OS X v10.4

iChat Server Demo

Chris LeCroy

https://developer.apple.com/wwdcsecure/

Weblog Server

Blog Syndication Using RSS

https://developer.apple.com/wwdcsecure/

Why Host a Blog With Mac OS X Server?

Browser-based
Content Publishing

User and
Group Blogs

Built-in Themes

Standards-based

HTML, RSS and ATOM
Syndication

Easy Directory
Integration

Weblog Server

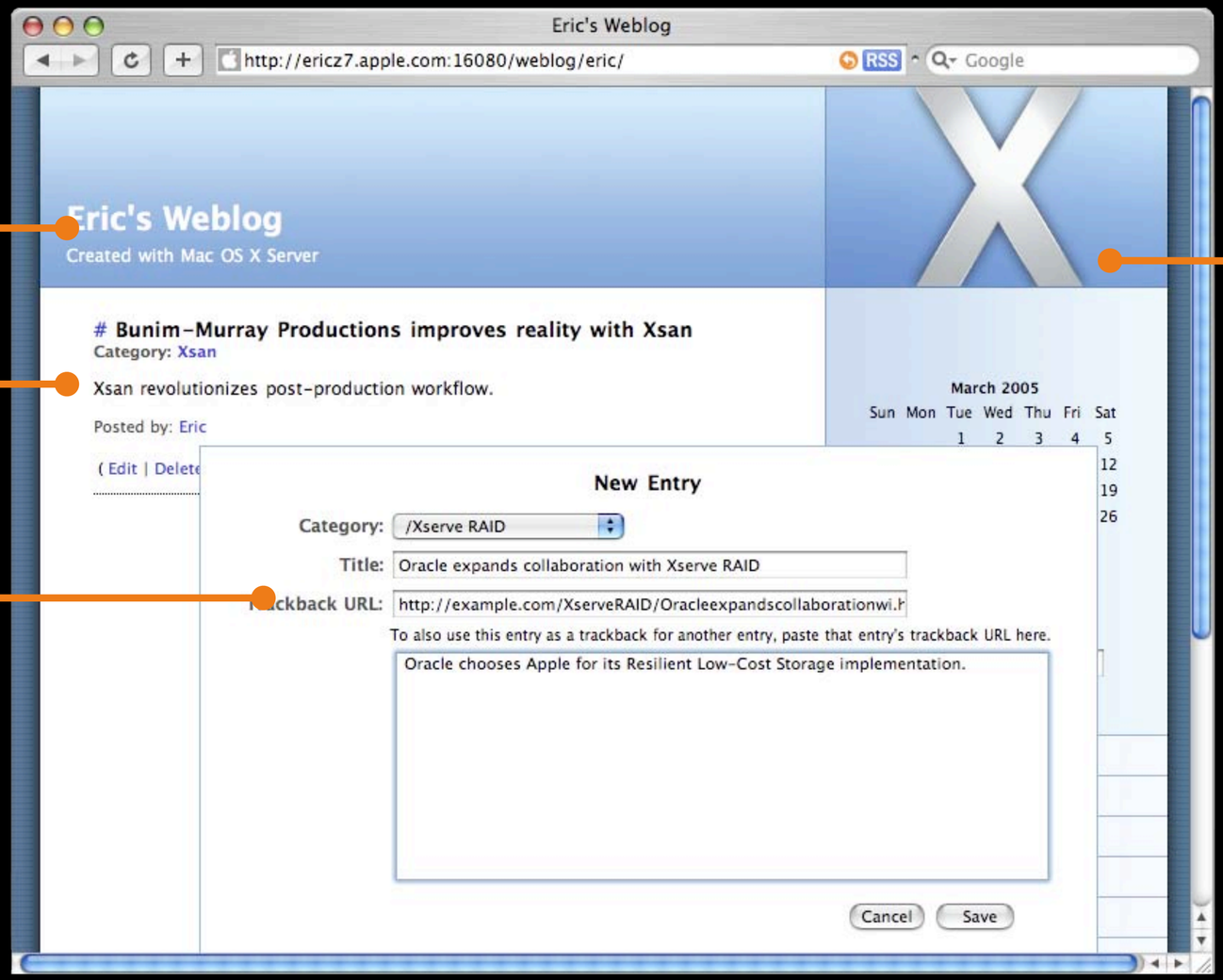
Security	- Service Access Control support - Kerberos authentication
Standards Based	- Based on Blojsom open source project - Supports RSS, RSS2, RDF, and ATOM protocols
Directory Integration	- User and group blogs
Administration	- Auto-creation of blogs
Flexibility	- Customizable themes - Plugin API for extending functionality

Browser-Based Content Publishing

Integrated with LDAP

Calendar-based navigation

Browser-based posting; also supports XML-RPC, ATOM API



Customizable themes

Weblog Server Demo

Chris LeCroy

https://developer.apple.com/wwdcsecure/

Xgrid

Apple's Distributed Computing Solution

https://developer.apple.com/wwdcsecure/

Why Use Mac OS X Server for Distributed Computing?

64-bit
Architecture

Cluster
Management Tools

Xgrid Built into
the OS

Single Sign-on
Authentication

Xcode 2
Development Tools

Easy Directory
Integration

How It Works

Flexible Three-Tier Architecture

Client

1 Client submits job to Controller

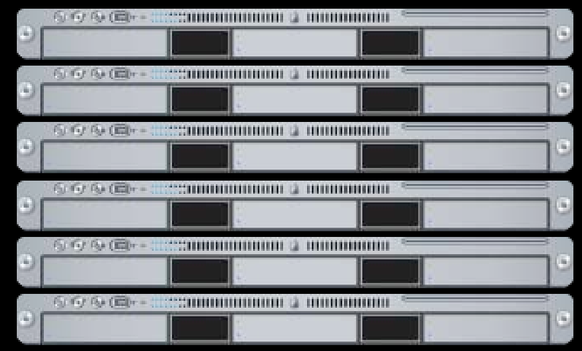
5 Client collects result from Controller

Controller

4 Controller collects results and notifies Client of job completion

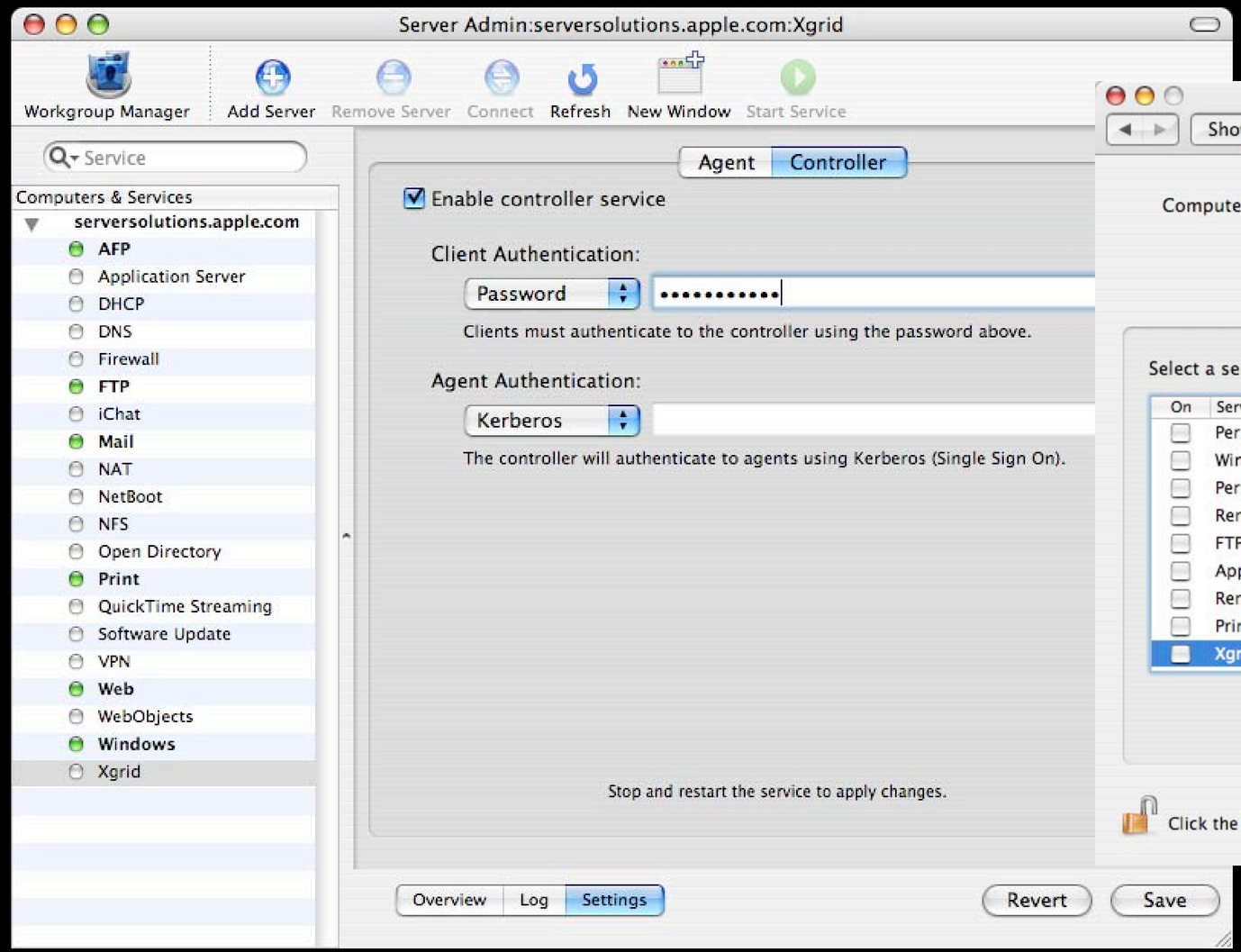
2 Controller splits the job into tasks and assign them to available agents

3 Agents return results to Controller

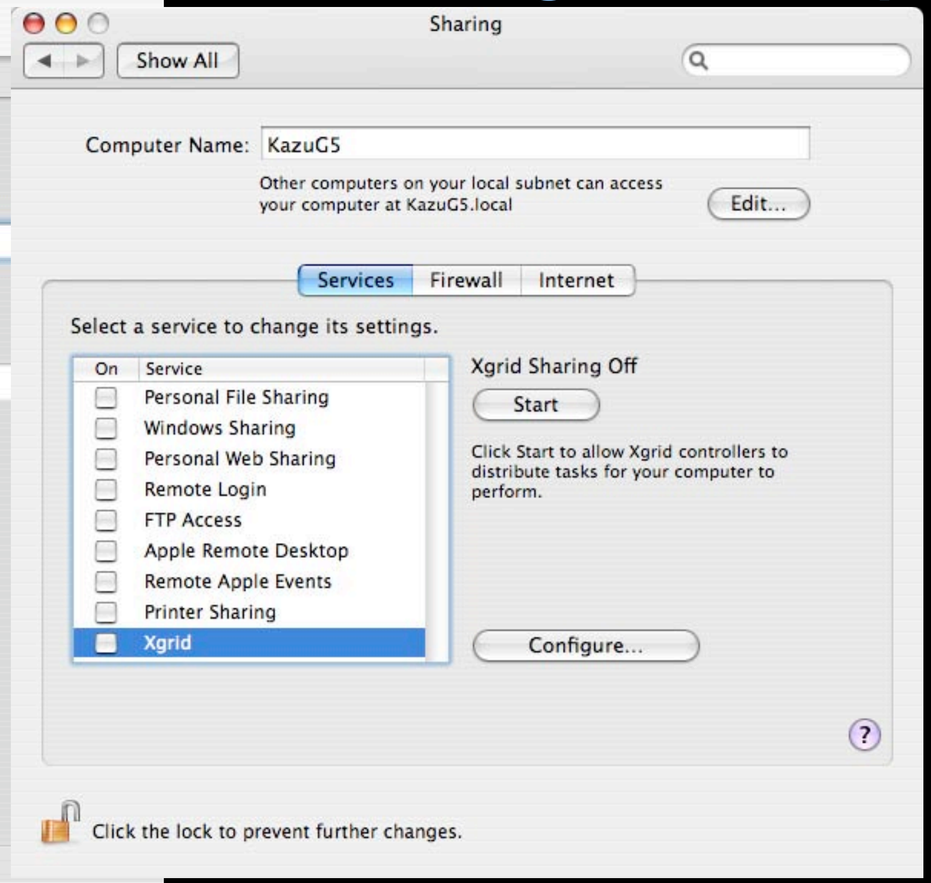


Agents

Built Into Every Tiger and Tiger Server



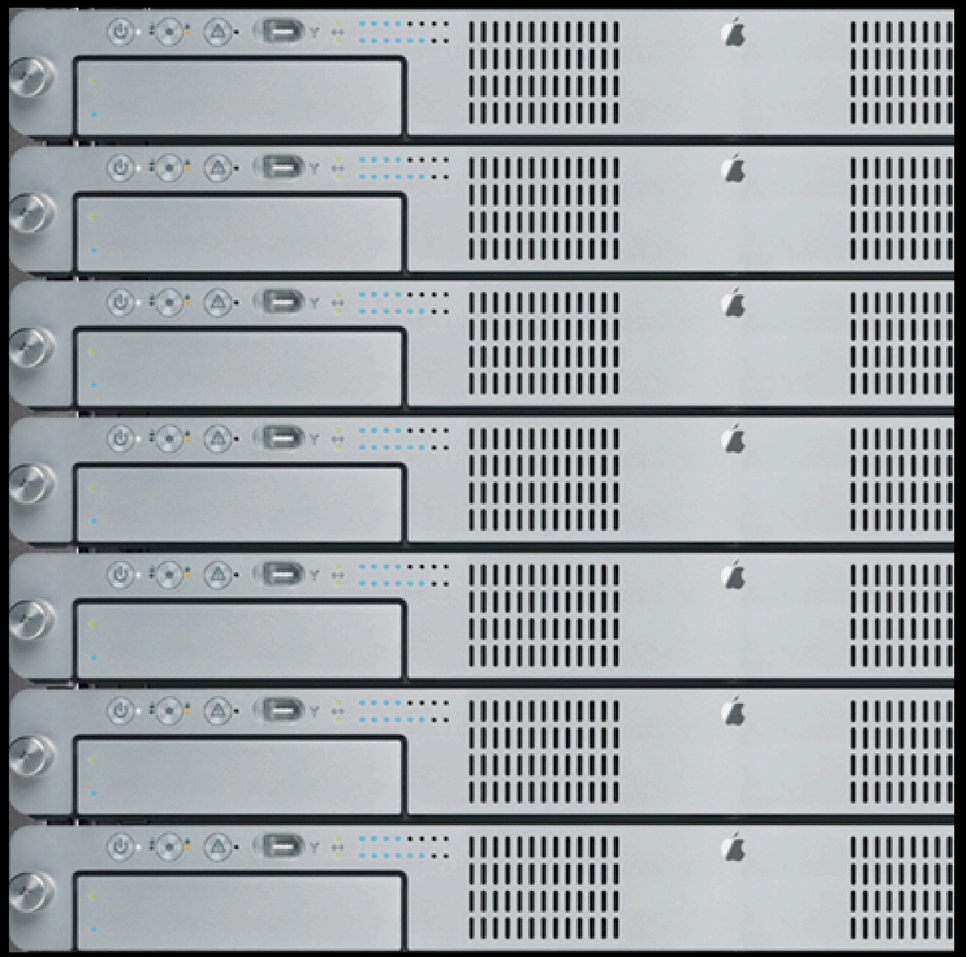
Tiger Server



Tiger Desktop

Panther Desktop Download

Xgrid in Tiger Server



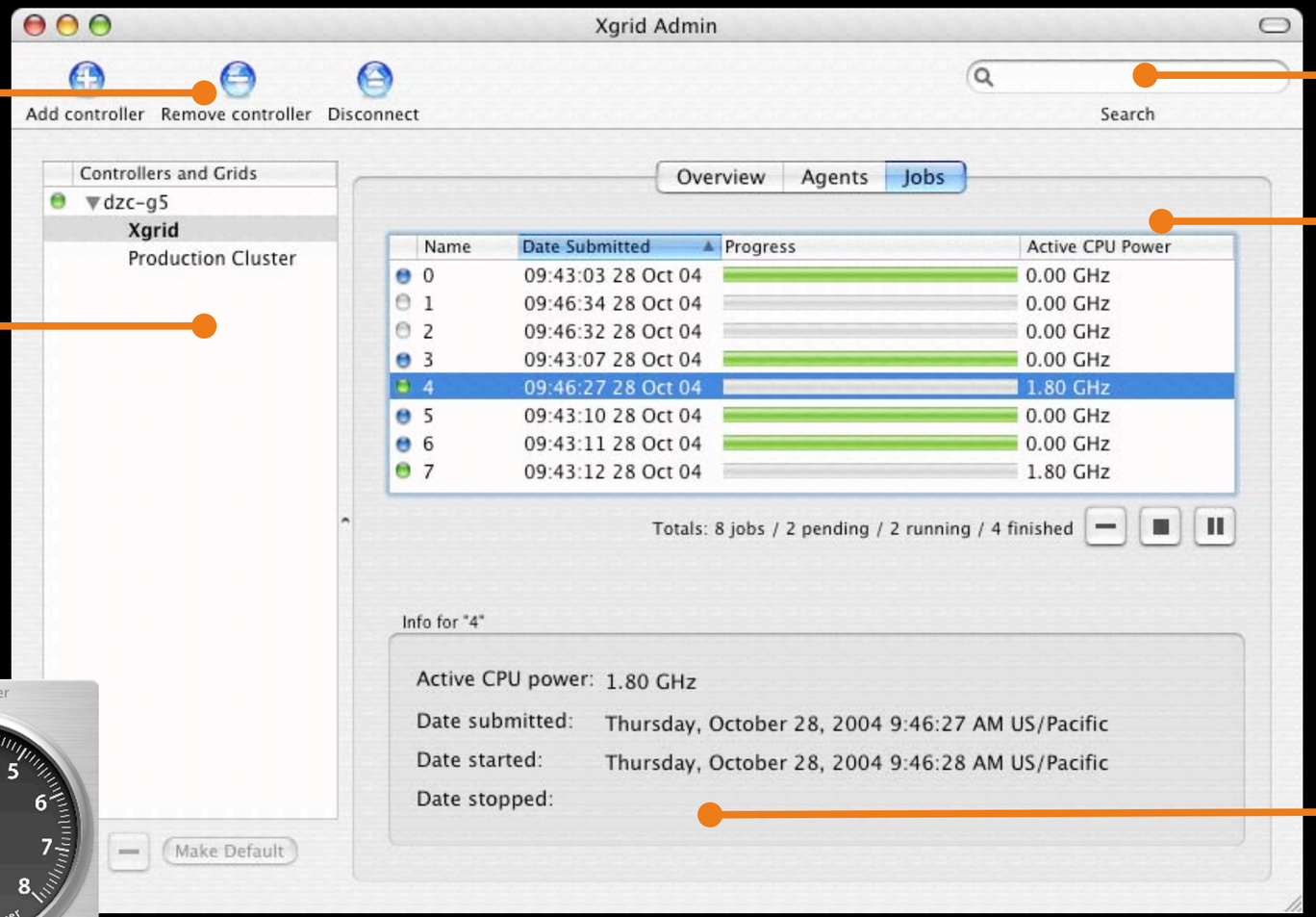
Simple Setup	Auto-discovery using Bonjour and DNS
Directory Integration	Single sign-on authentication using Kerberos and LDAP via Open Directory or Active Directory
Flexible Client	Submit jobs using existing command-line tools or custom-built Cocoa applications
Complex Workflows	Any job or task can specify a dependence on any other job or task
Scalability	10,000 queued jobs, 10,000 tasks per job, 2GB of data per job

Xgrid Administration

Controllers
Automatically discover or manually add new Xgrid controllers

Grids
Each controller's agents can be partitioned into one or more distinct grids

Tachometer
Reflects aggregate CPU power of active agents



Search
Quickly find a given controller, agent, or job, even on large networks

Manage
Watch and control activity

Agents
Monitor, pause, resume, or reassign specific agents

Jobs
Monitor, pause, resume or delete jobs.

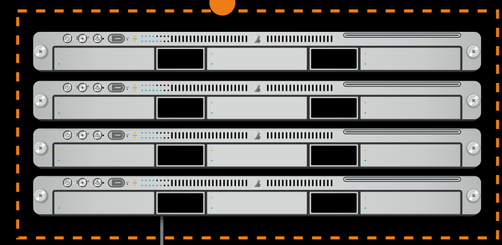
Statistics
Show activity of a particular job, agent, grid, or controller

Deployment Example

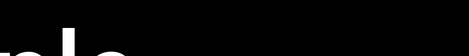
Utilize All Available Resources

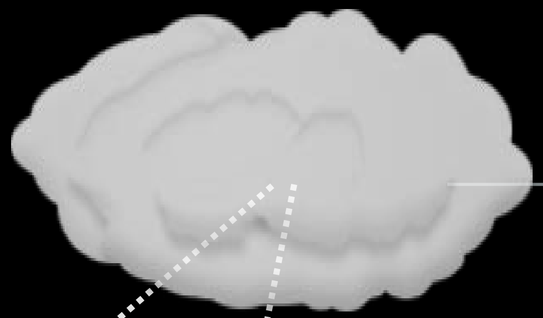
Detachable Clients
Submit jobs, then either wait for or be notified of results

Full-time Agents
Dedicated exclusively to running Xgrid tasks



Controller
Split job into tasks, resubmit failures, retrieve results





Internet Agents
Volunteer to help with large-scale "@Home" calculations

Part-time Agents
Run Xgrid tasks when users are not active

Computer labs

Workstations

Learn More About Xgrid

Mac OS X and Scientific Computing	Session 606 Tuesday 3:30pm
HPC Technology Update	Session 609 Tuesday5:00pm
Using Xgrid to Create and Deploy Distributed Computations	Session 616 Wednesday 2:00pm
Large Installation and HPC Systems Administration	Session 618 Wednesday 3:30pm

Desktop Management

Michael Lopp
Sr. Engineering Manager

https://developer.apple.com/wwdcsecure/

Desktop Management at Apple

- Tiger Server provides a suite of desktop management tools
  - Managed Desktop via Workgroup Manager
  - System Imaging
- New in Tiger, Tiger Server
  - Software Update Server
  - Portable Home Directories
- Apple Remote Desktop 2.2
  - Lightweight desktop management

Software Update Server

https://developer.apple.com/wwdcsecure/

IT's Software Update Challenges

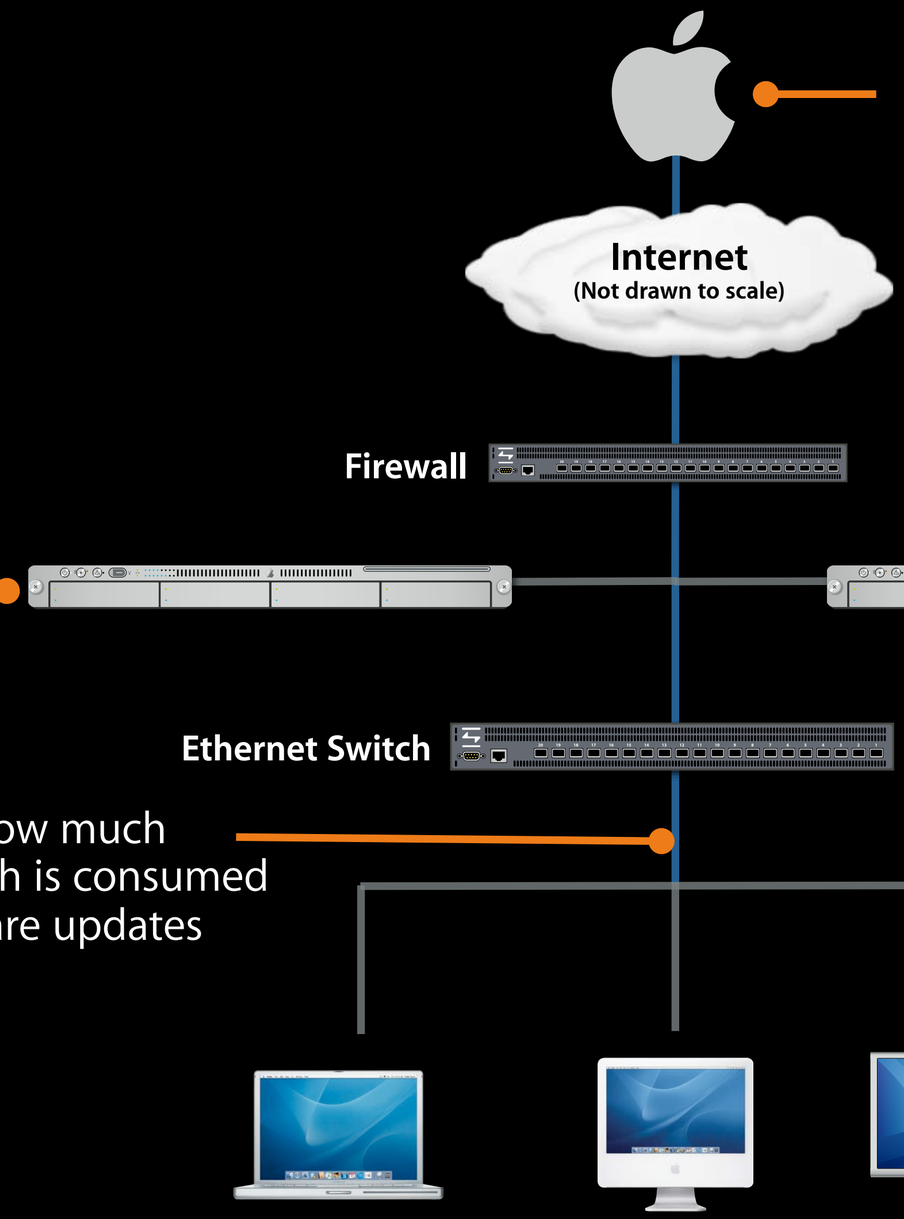
- How do I?
  - Maintain standard desktop configurations
  - Test updates before my users
  - Minimize bandwidth costs

- When…
  - Software updates are a force of nature
  - Users downloads whenever they like

Software Update

- Proxy caching of all Apple software update clients
- Management and control of software update availability
- Network bandwidth conservation

Software Update Server



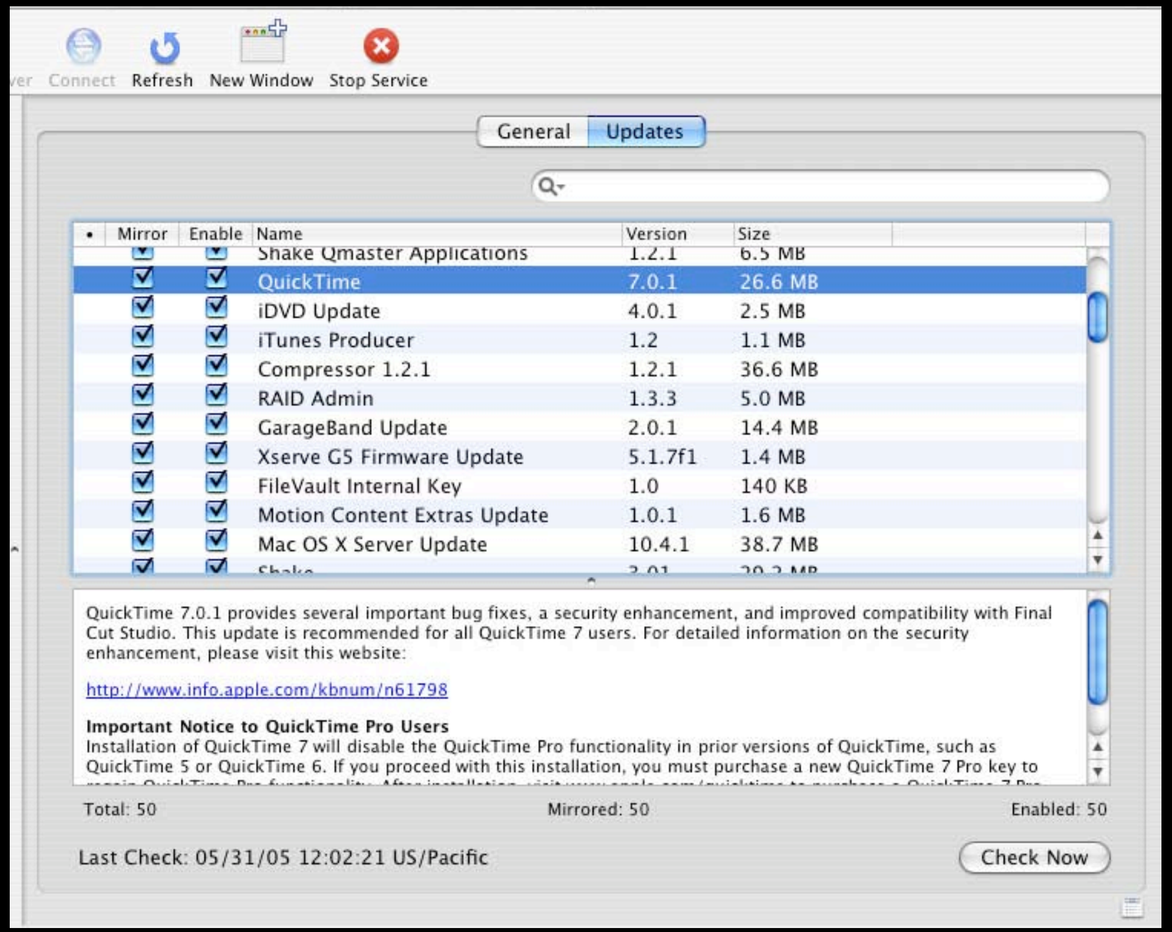
1
Local Software Update server automatically downloads and stores updates to mirror all Apple updates

2
Control how much bandwidth is consumed for software updates

3
Managed software update preferences stored in Open Directory Server

Software Update—Ease of Use

- Integrated into the familiar Server Manager interface



Software Update Management Scenarios

- Managed Environment via Workgroup Manager
- Managed Network via Directory Services
- Customize images via command-line configuration

Portable Home Directories

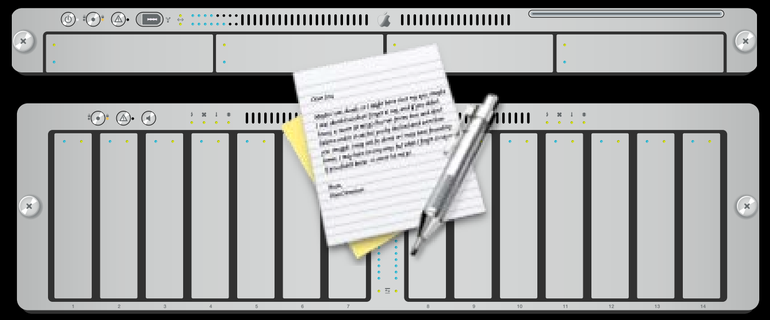
https://developer.apple.com/wwdcsecure/

IT's Mobility Challenges

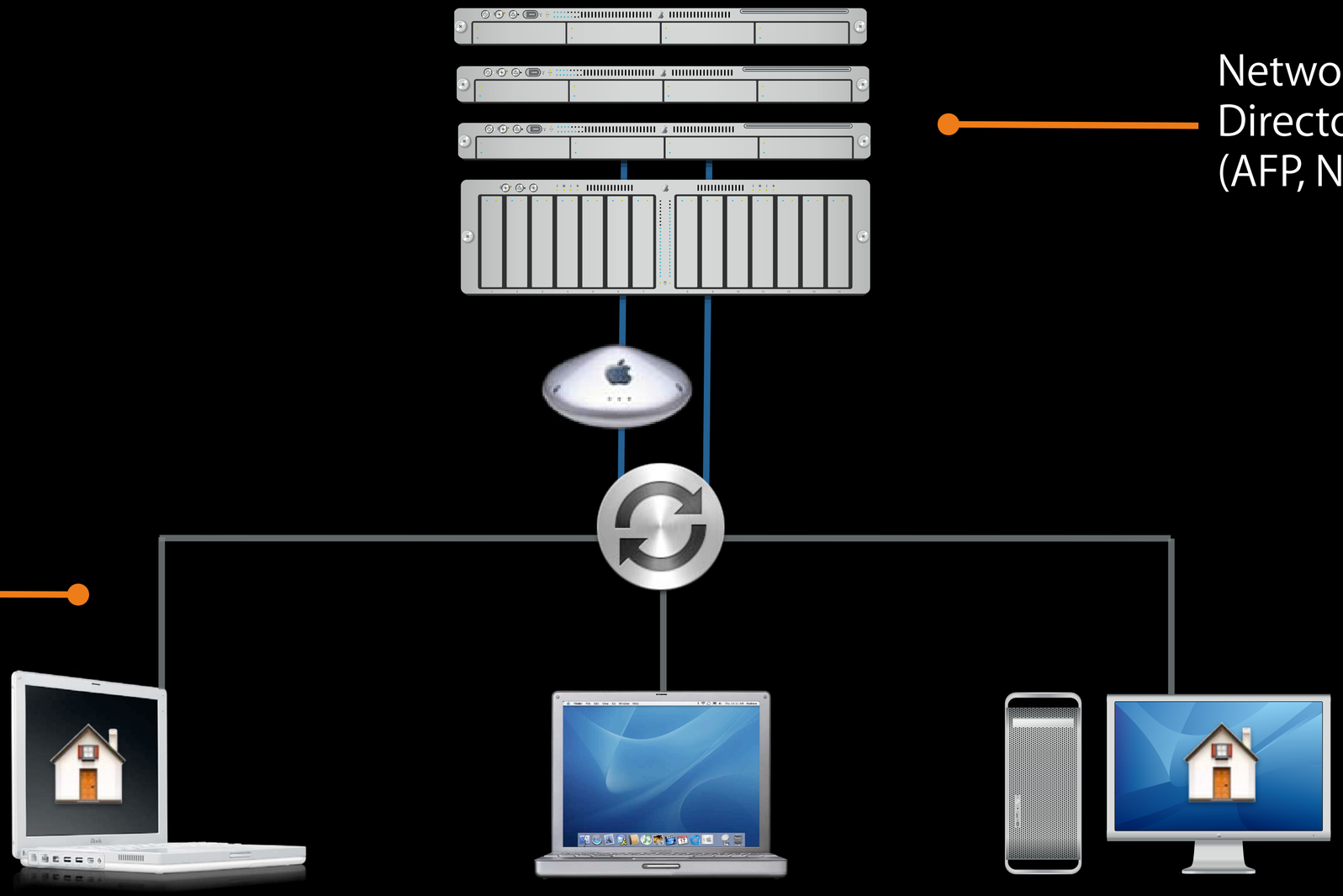
- Mobile computers wandering everywhere
- Users actively using multiple machines
- Content stuck in one place
- The technology to solve this already exists…

Your Most Important File

A worst case scenario

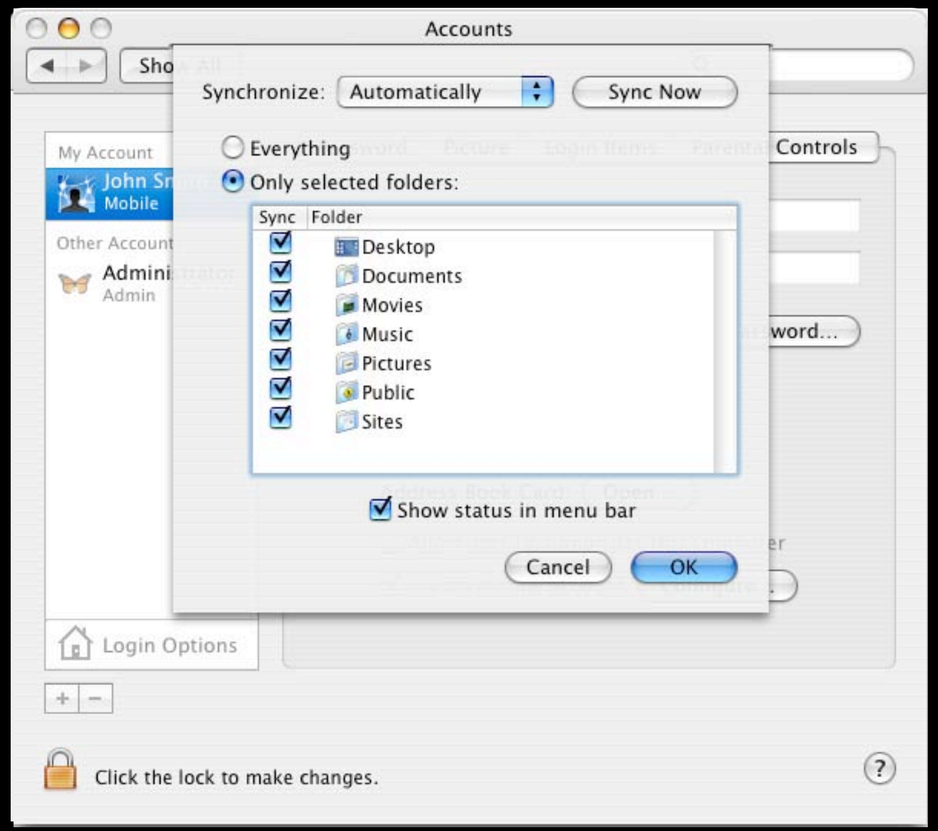


A Day in the Life of Your Most Important File



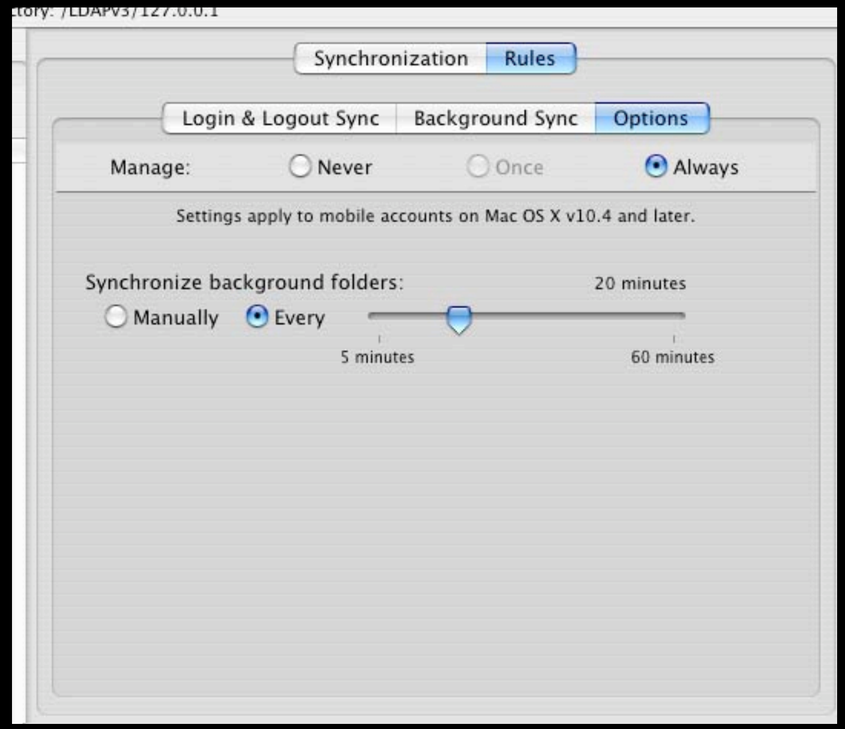
Getting Started...

- From Accounts System Preference



Getting Started...

- From Workgroup Manager



Portable Home Directory Demo

“The Dog Ate My Powerbook Scenario”

https://developer.apple.com/wwdcsecure/

Related Sessions

Monitoring Your System with ARD and Open Source Tools	Session 629 Thursday 2:00PM
Designing Network-Friendly Applications	Session 630 Thursday 3:30PM
Managing Clients in the Enterprise	Session 621 Wednesday 5:00PM
Mobile User Management	Session 626 Thursday 10:30AM
Real-World Desktop Management Practices	Session 644 Friday 5:00 PM

Wrap-Up

https://developer.apple.com/wwdcsecure/

Tiger Server

For More Information

https://developer.apple.com/wwdcsecure/

Documentation, Sample Code, and Other Resources

http://developer.apple.com/wwdc2005/

Related Sessions

Active Directory Integration	Session 608 Tuesday 3:30PM
Hands - On: Network Authentication	Session 636 Friday 2:00PM
WebObjects Overview	Session 604 Tuesday 10:30AM
WebObjects and J2EE Deployment Workshop	Session 610 Tuesday 5:00PM

Related Sessions

Building Xsan Applications	Session 622 Wednesday 5:00PM
Mac OS X Server Feedback Forum	Session 614 Wednesday 10:30AM
Hands-On Labs	All Week

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